QUANTIZATION LOOP WITH HEURISTIC APPROACH

ABSTRACT

A quantizer finds a quantization threshold using a quantization loop with a heuristic approach. Following the heuristic approach reduces the number of iterations in the quantization loop required to find an acceptable quantization threshold, which instantly improves the performance of an encoder system by eliminating costly compression operations. A heuristic model relates actual bit-rate of output following compression to quantization threshold for a block of a particular type of data. The quantizer determines an initial approximation for the quantization threshold based upon the heuristic model. The quantizer evaluates actual bit-rate following compression of output quantized by the initial approximation. If the actual bit-rate satisfies a criterion such as proximity to a target bit-rate, the quantizer sets accepts the initial approximation as the quantization threshold. Otherwise, the quantizer adjusts the heuristic model and repeats the process with a new approximation of the quantization threshold. In an illustrative example, a quantizer finds a uniform, scalar quantization threshold using a quantization loop with a heuristic model adapted to spectral audio data. During decoding, a dequantizer applies the quantization threshold to decompressed output in an inverse quantization operation.